

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2, 7, 16, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claims 2 and 16 each recite “stannic acid is obtained by dissolving, in water, a hydroxide (stannic acid) obtained through...”. The scope of the claim is confusing because it is not clear what is meant by the phrase. How is a stannic acid obtained by dissolving a stannic acid in water? Should the first recitation of stannic acid in the above phrase be changed to “aqueous solution”? Further, it is not clear what is meant by hydroxide (stannic acid). Does hydroxide refer to the stannic acid? Clarification is requested.

(b) Claims 7 and 20 each recite “wherein the water-soluble amine is at least one species selected from the group consisting of trimethylammonium hydroxide...”. The scope of the claims is confusing given that trimethylammonium hydroxide is not a water-soluble amine.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

4. Claims 1-5, 10-11, 14-19, and 23-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kanbara et al. (*Preparation of Electrically Conducting Indium-Tin Oxide Thin Films by Heat Treatment of Mixed-Metal Hydroxide Dispersion Containing Polymer Binder*).

Kanbara et al. disclose coating solution for forming transparent conductive tin oxide film which comprises aqueous solution containing stannic acid, i.e. obtained from hydrolyzing tin chloride to form tin hydroxide solution to which is added aqueous ammonia, and 0.075-4% water-soluble polymer such as polyvinyl alcohol and hydroxypropylcellulose wherein the polymer is dissolved in the aqueous solution. It is further disclosed that the coating solution is applied to an object to form a coating film and then dried at 70 °C followed by heating at 350-900 °C. The resulting tin oxide film has specific resistance of $1.3 \times 10^{-3} \Omega \text{ cm}$ (page 643, second last paragraph on right hand side (RHS), paragraph bridging pages 643-644, page 644, first full paragraph on LHS, page 644, lines 5-6 on RHS, Table I).

In light of the above, it is clear that Kanbara et al. anticipate the present claims.

Art Unit: 1714

5. Claims 1-4, 6, 8-18, and 21-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Kurachi et al. (U.S. 6,066,442).

Kurachi et al. disclose coating solution for forming transparent conductive tin oxide film which comprises aqueous solution containing stannic acid, i.e. obtained from dissolving stannic chloride in water and aqueous ammonia, and water-soluble polymer such as polyvinyl alcohol, carboxymethylcellulose, hydroxyethylcellulose, and polyacrylamide wherein the polymer is dissolved in the aqueous solution. The solution has a pH of, for instance, 10. It is disclosed that the stannic chloride is doped with antimony or fluorine compound (col.7, lines 55-59, col.9, lines 62-66, col.10, lines 10-12, 29-40, 45, and 50, col.23, line 27-col.24, line 6, and col.50, lines 48-49). Although there is no disclosure of specific resistance of tin oxide film, given that Kurachi et al. disclose tin oxide film obtained from coating solution identical to that presently claimed, it is clear that the tin oxide film would inherently possess specific resistance as presently claimed.

In light of the above, it is clear that Kurachi et al. anticipate the present claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanbara et al. ("*Preparation of Electrically Conducting Indium-Tin Oxide Thin Films by Heat Treatment of Mixed-Metal Hydroxide Dispersion Containing Polymer Binder*") or Kurachi et al. (U.S. 6,066,442) either of which in view of McHenry et al. (U.S. 4,113,507).

The disclosure with respect to Kanbara et al. and Kurachi et al. in paragraphs 4 and 5, respectively, are incorporated here by reference.

The difference between Kanbara et al. or Kurachi et al. and the present claimed invention is the requirement in the claims of amine.

McHenry et al., which is drawn to tin oxide film, disclose the use of amine such as trimethylamine, triethylamine, and dimethylamine as solvating agent (col.4, lines 35-46, col.3, lines 58-62, and col.4, lines 17-19 and 21-25).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use amine in Kanbara et al. or Kurachi et al., and thereby arrive at the claimed invention.

9. Claims 8, 12, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanbara et al. ("*Preparation of Electrically Conducting Indium-Tin Oxide Thin Films by Heat Treatment of Mixed-Metal Hydroxide Dispersion Containing Polymer Binder*") in view of Yoshizumi (U.S. 4,431,764).

The disclosure with respect to Kanbara et al. in paragraph 4 above is incorporated here by reference.

The difference between Kanbara et al. and the present claimed invention is the requirement in the claims of dopant.

Yoshizumi, which is drawn to antistatic tin oxide transparent coating, disclose the use of antimony oxide dopant in order to produce coating with good electrical resistance as well as color tone and transparency (col.2, lines 22-30 and col.3, lines 1-7).

In light of the motivation for using antimony oxide dopant disclosed by Yoshizumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such dopant in Kanbara et al. in order to produce coating solution or tin oxide film which has good electrical resistance as well as color tone and transparency, and thereby arrive at the claimed invention.

10. Claims 9, 13, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanbara et al. ("*Preparation of Electrically Conducting Indium-Tin Oxide Thin Films by Heat Treatment of Mixed-Metal Hydroxide Dispersion Containing Polymer Binder*") in view of Clough et al. (U.S. 5,705,265).

The disclosure with respect to Kanbara et al. in paragraph 4 above is incorporated here by reference.

The difference between Kanbara et al. and the present claimed invention is the requirement in the claims of fluorine dopant.

Clough et al., which is drawn to tin oxide coatings, disclose the use of fluorine dopant in order to produce coating with good electric properties, morphology, and stability (col.10, lines 50-59).

In light of the motivation for using fluorine dopant disclosed by Clough et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such dopant in Kanbara et al. in order to produce coating solution or tin oxide film which has good electric properties, morphology, and stability, and thereby arrive at the claimed invention.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fujioka et al. (U.S. 4,389,451) disclose record material comprising electroconductive layer comprising inorganic compounds coated with electroconductive substance consisting of stannic oxide and antimony.

Sato et al. (U.S. 5,204,177) disclose conductive coating material comprising binder and conductive particles obtained by hydrolyzing tin compound doped with antimony or fluorine, however, there is no disclosure of amine or ammonia as presently claimed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Callie E. Shosho
Examiner
Art Unit 1714

CS
July 2, 2003